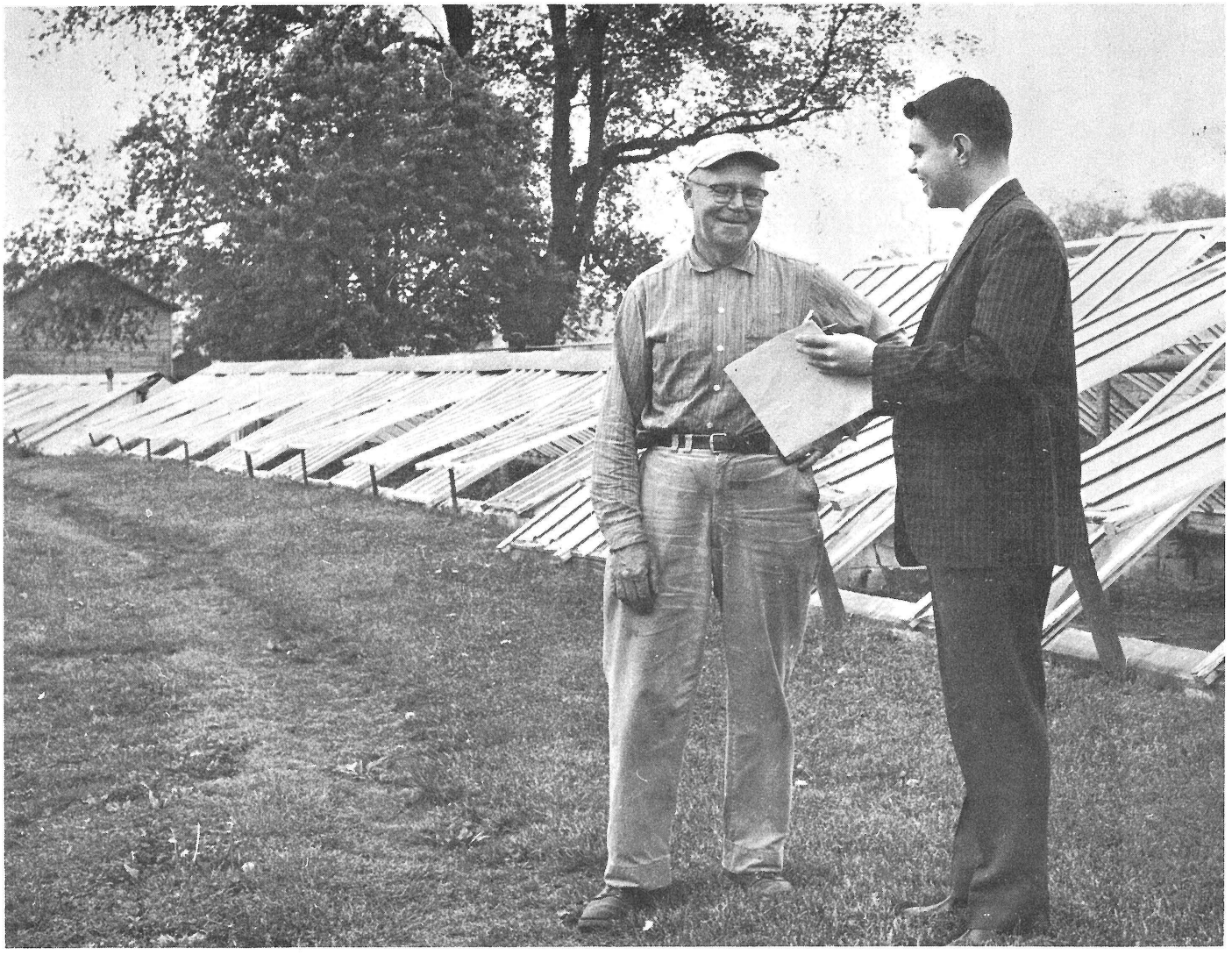
Research Bulletin 912

June 1962

COMMUNITY NORMS, OPINION LEADERSHIP AND INNOVATIVENESS AMONG TRUCK GROWERS

Everett M. Rogers and Rabel J. Burdge



Ohio Agricultural Experiment Station

Wooster, Ohio

This page intentionally blank.

COMMUNITY NORMS, OPINION LEADERSHIP, AND INNOVATIVENESS AMONG TRUCK GROWERS*

Everett M. Rogers and Rabel J. Burdge**

SUMMARY

The main purposes of the present study were to determine the amount of variation (1) in innovativeness, and (2) in opinion leadership of truck growers explained by community norms and other variables. Most of the data utilized in the present investigation came from a random sample composed of 76 truck growers in Washington County, Ohio.

Truck growers are defined as those farmers who raised truck vegetable crops for sale in 1960. The truck growers resided in seven geographically distinct communities. A norm on innovativeness for each community was computed by averaging the adoption scores for the farmers residing in that community. A norm is defined as a common and recurrent pattern of overt behavior among the members of a group.

The major findings from the present investigation may be summarized as follows:

1. Innovativeness is defined as the degree to which an individual is relatively earlier to adopt new ideas than the other members of his social system. In the present study, innovativeness among truck growers was found to be related to higher education, larger sized operations, greater cosmopoliteness, and other factors. The characteristics of adopter categories are similar to those found in other studies of the diffusion of farm innovations.

2. Innovators and early adopters used truck-growing information sources that were relatively more direct to agricultural scientists. Late majority and laggards, in comparison, were more dependent on relatives or neighbors as information sources. More innovative growers were more likely to visit the Substation Farm to seek information.

3. Opinion leaders are defined as those individuals from whom others seek information and advice. Opinion leaders in the present study were the 14 farmers named by three or more other growers as a source of information and advice. When compared to their "followers", opinion leaders were characterized as slightly older and more highly educated, farming larger sized operations, more cosmopolite, using information sources more direct to scientists, higher social status, and more innovative.

4. A deviancy-from-norms score was computed for each grower to measure how closely the individual's innovativeness conformed to his community's norm on innovativeness. Opinion leaders were found to conform to the norms on innovativeness more closely than the followers. A multiple correlation approach to predicting opinion leadership indicated that deviancy-from-innovativeness-norms explained a larger portion of variation in opinion leadership than any of the three individual characteristics analyzed.

5. Both the configurational and the multiple correlation approaches were utilized to predict innovativeness in the present study. The four independent variables included in the configurational approach were community norms on innovativeness, size of operation, opinion leadership, and directness of communication behavior with agricultural scientists.

These same four variables plus a fifth, social status, were included in the multiple correlation approach to predicting innovativeness. When compared to previous studies, the relatively larger amount of variation in innovativeness explained (64.1 percent) is mainly due to inclusion of a previously unused variable, community norms on innovativeness.

INTRODUCTION

While large resource investments are made annually in agricultural research, much less effort is expended to determine whether the results of this research are utilized by farmers and others. Numerous research studies have been completed by rural sociologists on the diffusion and adoption of farm innovations, and the present publication is one contribution in this research tradition. The long-range goal of diffusion research is to more fully understand the process by which new farm ideas are communicated from agricultural scientists to farmers. Over 300 previous studies have been completed on the spread of farm innovations, but almost none of these investigations have emphasized the importance of community norms on the diffusion and adoption of innovations.

---

*Data reported in this bulletin were gathered as a part of Ohio Agricultural Experiment Station Hatch 166, The Communication Process and the Adoption of Farm and Home Practices.

**Associate Professor of Rural Sociology and formerly Research Assistant in Rural Sociology, respectively, at the Ohio Agricultural Experiment Station.

Purpose

The present study seeks to determine the amount of variation in innovativeness of truck growers explained by community norms and by individual characteristics. Because the respondents live in seven rather distinct communities in Washington County, Ohio, the present investigation provides a unique opportunity to determine the effect of group norms on the adoption of new farm ideas. Community norms on innovativeness are also utilized, along with other variables, to explain the variation in opinion leadership. The respondents are relatively more specialized than the average Ohio farmer, and the present investigation thus provides information about how farm innovations diffuse among specialized farmers.

Locale of the Study

Washington County, located in the extreme southeastern corner of Ohio, was chosen as the locale for the present investigation (Figure 1). Reasons for choosing this area were:

1. The location of the Vegetable Crops Substation Farm[1] near Devola, Ohio, within the county. The Substation Farm was first established by the Board of County Commissioners of Washington County in 1914. The land was donated to the Ohio Agricultural Experiment Station in 1952. This organization provides research funds and personnel for the operation of the Substation Farm, which is devoted entirely to research on truck vegetable crops.

2. The economic importance of truck-growing in Washington County. Truck crops commonly grown in the county are tomatoes, cabbage, peppers, cucumbers, potatoes, sweet corn, beans, melons, pumpkins, squash, broccoli, cauliflower, egg plant, and sweet potatoes. The county ranks sixth among the 88 Ohio counties in truck crop production; Washington County farmers devoted over 1,100 acres to these vegetables in 1960. Truck crops are the third most important source of agricultural income in the county. Cash receipts from truck crops in Washington County totaled over one million dollars in 1960.

Unique among the characteristics of the county are the location of seven relatively isolated communities along the Ohio and Muskingum Rivers. The topography of the area aids in the delineation of community boundaries (Figure 2), and thus simplifies the problem of locating community boundaries, which is often difficult today in the Midwest.

[1]Referred to elsewhere in the present bulletin as the Substation Farm.

Data-Gathering

A list of the farmers who raised truck vegetable crops in Washington County during 1960 was secured from the records of the Marietta Truck Growers Association (MTGA), the County Extension Agent, the manager of the Substation Farm, and from certain farm leaders in the county. A random sample of half of the known truck growers in Washington County were selected for personal interview. Truck growers were defined as those farmers who raised truck vegetable crops for sale in 1960.

Almost all of the data were gathered during a five-day period of interviewing in 1960. Faculty members and graduate students in rural sociology conducted the research interviews. Only 1 of the 77 truck growers who were contacted refused to be interviewed.

Selection of Leaders

Location of opinion leaders among the Washington County truck growers was important in the present investigation. Each of the 76 respondents were asked to name two other truck growers from whom they sought information and advice about new truck farming practices. Opinion leaders are defined as those individuals from whom others seek information and advice. Opinion leaders were considered the 14 farmers who were named by three or more growers as a source of information and advice. Seven of the 14 opinion leaders were already included in the original random sample of 76 growers. The seven remaining leaders were personally interviewed and are referred to as "extra leaders" in the present report. Data from these seven extra leaders are utilized only in the section of the present bulletin dealing with opinion leadership.

MEASURING INNOVATIVENESS

A major dimension of analysis throughout the present publication is innovativeness. Innovativeness is the degree to which an individual is relatively earlier to adopt new ideas than the other members of his social system.[2]

Adopter Categories

For the sake of presentation and understanding, the innovativeness dimension is divided into five adopter categories. The first farmers to adopt new ideas are innovators. Other adopter categories, in order of their degree of innovativeness, are early

[2]Everett M. Rogers, Diffusion of Innovations, N. Y., Free Press, 1962.

Figure 1.–Location of Washington County in Ohio.

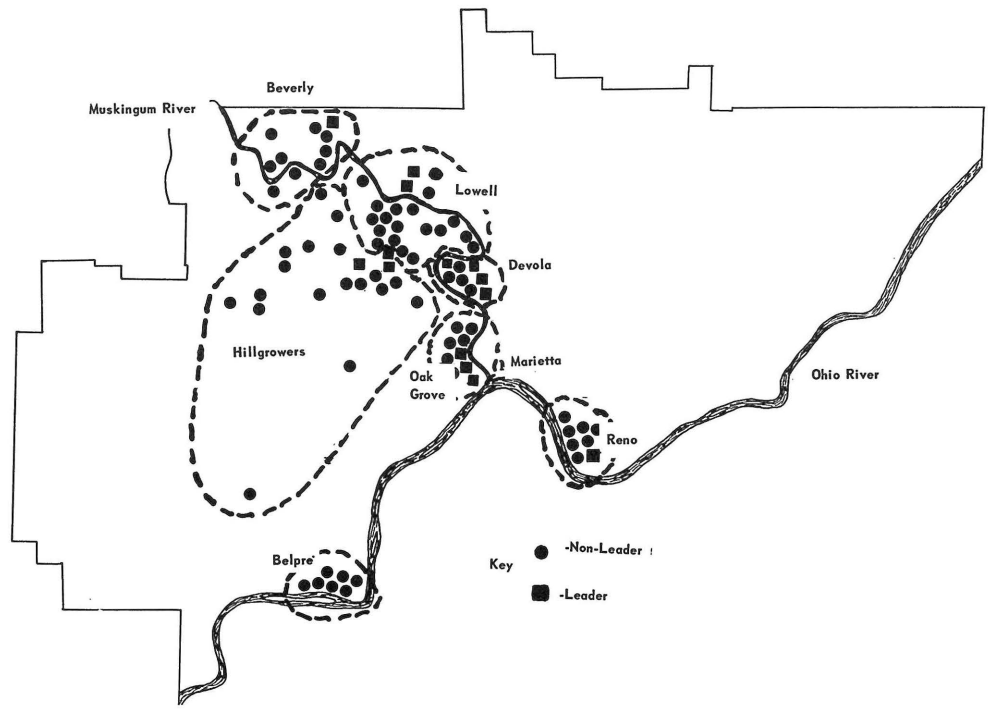


Figure 2.–Location of the Respondents in Seven Truck-Growing Communities in Washington County, Ohio.

adopters, early majority, late majority, and laggards. Growers in the present study were classified into the five adopter categories on the basis of their scores on an adoption-of-truck-crops-innovations scale. The 17 new ideas included in this scale were selected by the following criteria:

1. Each innovation was developed or experimentally tested at the Substation Farm by Ohio Agricultural Experiment Station scientists.

2. The 17 innovations were applicable to most truck growers and were generally low in cost.

3. The new ideas were adopted mainly in the past ten years so the growers' recall of adoption dates was less difficult.

The 17 practices included in the adoption scale are: (1) spray with Malathion or Thiodin for aphids on tomatoes, (2) spray with DDT for sweet corn earworm, (3) spray with Sevin for bean beetles, (4) use systemic potato insecticides in fertilizer for leaf hoppers, (5) irrigate, (6) use double stem pruning on tomatoes, (7) plant Queens, Prichard, or Morton Hybrid tomato varieties, (8) plant Early Marvel or CC Cross cabbage varieties, (9) plant Marketeer cucumber variety, (10) use container-grown plants, (11) use peat plant pots, (12) spray or dust with purified DDT or Dieldrin on cucumbers and melons, (13) spray or dust with recommended fungicides for control of early blight on tomatoes, (14) spray or dust with recommended fungicides for early and late blight on potatoes, (15) use a seed treatment to prevent "damping off" of vegetables in the plant bed or the field, (16) apply trace elements like boron, molybedum, or magnesium to the soil, and (17) use a plant-setting machine for tomatoes, cabbage, or peppers.

The reliability, internal consistency, and unidimensionality of adoption scales has been amply established by rural sociologists in previous studies.[3] Evidence of the validity of the present adoption scales was secured by asking a professional agricultural worker, who was acquainted with a majority of the respondents, to rate each of them as to innovativeness on a five point scale. The association (Robinson's "A") between these innovativeness ratings and the growers' adoption-of-truck-crops-innovations scores is +.87 which is significant at the one percent level. This relationship provides some evidence that the present adoption scale is valid, that is, measures the dimension it is intended to measure.

[3]These scale analyses of adoption scales were summarized by Everett M. Rogers and L. Edna Rogers, "A Methodological Analysis of Adoption Scales", Rural Sociology, 26:325-336, 1961.

COMMUNITY NORMS ON INNOVATIVENESS

One of the novel characteristics of truck growers in Washington County is that they reside in seven relatively distinct communities (Figures 4 and 5). In discussions both with change agents in the county before the interviewing began, and with respondents, it became obvious that the seven communities varied in their norms on innovativeness. A norm is a common and recurrent pattern of overt behavior among the members of group.[4] It was expected that the community norms would have an influence on the behavior of the truck growers living in each community.

The communities' norms on innovativeness were measured by averaging the adoption-of-truck-crops-innovations scores of the farmers interviewed in each community.[5] The seven communities[6] and the norm on innovativeness for each are:

Community	Norm on Innovativeness
1. Oak Grove	5.15 (Most innovativeness)
2. Devola	4.92
3. Beverly	4.60
4. Reno	4.22
5. Lowell	3.95
6. Belpre	3.86
7. Hillgrowers	3.83 (Least innovativeness)

[4]Past definitions of norms have been of two types: (1) those defining norms as statistical measures of central tendency, and (2) those defining norms as role expectations. The definition in the present study adheres more closely to the former than to the later type of definition.

[5]A similar measure of community norms on innovativeness was utilized by C. Paul Marsh and A. Lee Coleman, "Farmers' Practice Adoption Rates in Relation to Adoption Rates of 'Leaders'", Rural Sociology, 19:180-181, 1954; Anne W. van den Ban, "Locality Group Differences in the Adoption of New Farm Practices," Rural Sociology, 25:308-320, 1960; and W. B. Rahudkar, "Local Leaders and the Adoption of Farm Practices", Nagpur (India) Agriculture College Mazagine, 34:1-13, 1960.

However, van den Ban, in a series of studies in Netherlands communities, measured community norms on innovativeness with the responses to a question, "What do people in this community think of the first farmers to adopt new farm ideas?" This measure utilizes a role expectations definition of norm rather than a statistical measure of central tendency. Anne W. van den Ban, Boer en laudvoor lichtung: De communicatie ouer nieuwe landbouwmethodem, Assen, Netherlands, van Gorkum, (in press).

[6]The names used to refer to the seven communities in the present study are not, in all cases, their official names. For example, farmers in the "Hillgrowers" community actually secure certain community services at Churchtown, Watertown, and elsewhere. Likewise, growers in the "Beverly" community secure community services at Waterford, Coal Run, and Beverly, Ohio.

Figure 3.—Washington County Was Selected as the Locale for the Present Study Because of the Location of the Substation Farm and Because of the Economic Importance of Truck Growing in the County.

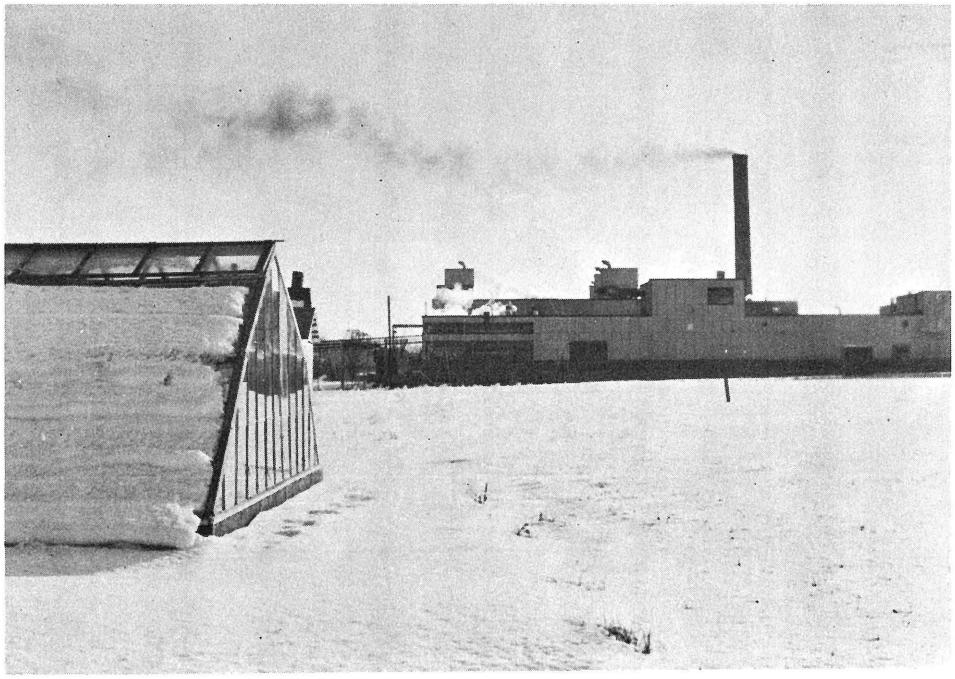


Figure 4.—One of the Problems of Truck Growers in the Belpre and Oak Grove Communities Is the Purchase of Crop Land for Industrial Sites.

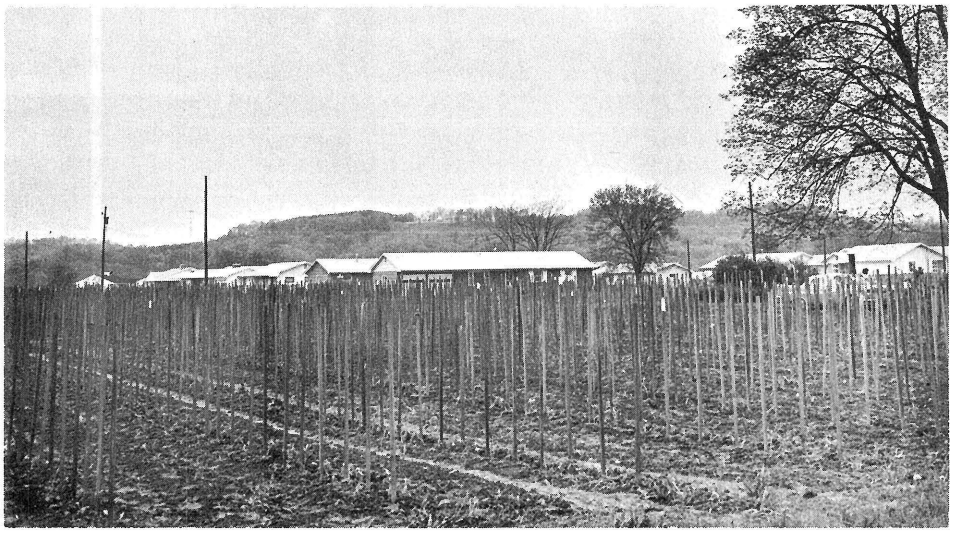


Figure 5.–The Ranch Homes Behind These Tomato Stakes Illustrate the Problem of Enroaching Suburbanization in the Oak Grove, Devola, and Belpre Communities.

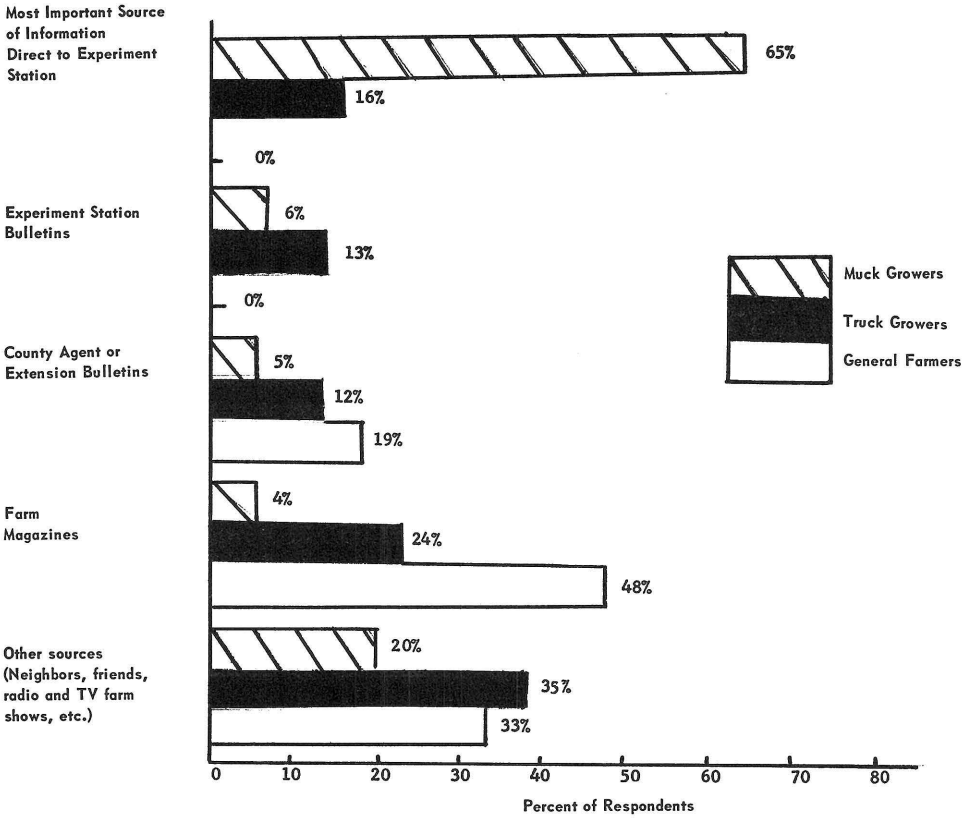


Figure 6.–Most Important Source of Information About Innovations for Muck Growers, Truck Growers, and General Farmers.

A validity check on the community innovativeness norms was available in the present investigation. Three professional workers, who were well acquainted with the growers in Washington County, were asked to rank the seven truck growing communities on innovativeness. The three judges' rankings, although made independently, were found to be highly consistent.[7] The judges' rankings of the seven communities on innovativeness were highly related[8] to the community norms on innovativeness, computed as an average of the adoption scores of the growers residing in each community. This relationship provides some evidence that the community norms on innovativeness are valid.

The characteristics of the truck growers residing in each of the seven communities are presented in Table 1. Wide differences among truck growers in each of the communities may be observed. Rank-order correlations of these characteristics with community norms on innovativeness are shown in Table 1.

[7] Kendall's Coefficient of Concordance, a measure of agreement, among the three rankings is +.67 which is significant at the five percent level.

[8] Spearman rank order correlation between the judges' composite rankings and the norms on innovativeness is +.99 which is significant at the one percent level.

CHARACTERISTICS OF ADOPTER CATEGORIES

Table 2 summarizes the characteristics of the five adopter categories. Innovativeness is generally, but not consistently, related to . . .

More education

Larger truck crop enterprises in acres and in number of workers employed

Bottomland rather than hilland

Closer proximity to the Substation Farm

More cosmopolite travel to observe innovations

More favorable attitudes toward innovators

More opinion leadership

In general, these characteristics of adopter categories are similar to those found in previous studies.

TABLE 1.–Characteristics of Truck Growers by Community in Seven Washington County Communities

Characteristics	Communities as Ranked in Order of Norms on Innovativeness							Rank-Order Correlation of Characteristics with Community Innovativeness Norms
	Oak Grove (N=8)	Devola (N=6)	Beverly (N=9)	Reno (N=7)	Lowell (N=16)	Belpre (N=7)	Hillgrowers (N=23)	
1. Average Age of Respondents	51	58	49	56	45	63	44	-.29
2. Average Years of Education	11.4	10.5	12.1	9.1	10.2	9.9	10.1	+.64
3. Percent Contact with Substation Farm in Last Year	50%	83%	33%	14%	12%	14%	35%	+.51
4. Average Distance from Substation Farm in Miles	4	1	8	9	4	15	6	+.51
5. Average Size of Farms in Acres	37	17	86	40	56	15	85	-. 66
6. Average Acres of Truck Crops	20	17	15	16	5	15	2	+.93
7. Average Number of Workers per Farm	5.6	6.2	7.3	5.4	6.3	16.6	4.4	+.04
8. Religous Denomination (Percent Protestant)	63%	50%	100%	100%	44%	86%	13%	+.35
9. Percent of Farms on Bottom Land	75%	100%	89%	100%	50%	100%	4%	+.32
10. Average Social Status	3.4	3.0	3.0	2.1	2.4	2.0	2.5	+.83
11. Percent with Favorable Attitude Toward Innovations	100%	67%	89%	86%	56%	43%	65%	+.79

TABLE 2.--Characteristics of Truck Growers by Adopter Category

Characteristics	Adopter Category					All Growers (N=76)
	Innovators (N=2)	Early Adopters (N=9)	Early Majority (N=25)	Late Majority (N=28)	Laggards (N=12)	
1. Average Age of Respondents	45	51	51	47	52	50
2. Average Years of Education	9.5	13.2	10.3	10.0	9.8	10.4
3. Average Acres of Truck Crops	21	31	12	4	2	10
4. Average Number of Workers per Farm	4.5	13.8	4.9	7.7	2.6	6.6
5. Percent of Farms on Bottomland	100%	89%	60%	50%	33%	57%
6. Average Distance from Substation Farm in Miles	7.0	7.6	10.8	10.8	11.9	10.5
7. Average Percent who Traveled Outside of County During Past Year to Observe New Truck-Growing Ideas	50%	44%	8%	4%	8%	12%
8. Percent with Favorable Attitude Toward Innovators	100%	100%	76%	68%	25%	68%
9. Average Number of Sociometric Opinion Leadership Choices from Other Growers	4.25	2.00	1.40	0.20	0	0.72
10. Average Social Status	3.5	3.3	2.8	2.5	1.8	2.6

COMMUNICATION BEHAVIOR

Previous research findings have indicated that innovative farmers obtain information more directly from scientific sources. Later adopters obtain new ideas from less direct sources such as friends, neighbors, and relatives.

Sources of Information about Innovations

The 76 truck growers in the present investigation were asked to report their most important source of information about truck-growing innovations. Table 3 shows the relative importance of each of these sources of information on the basis of adopter category. The sources of information in Table 3 are listed in order of directness with agricultural scientists. It can be seen that the more direct sources of information are more important for the innovators and early adopters than for the relatively later adopters.[9]

Figure 6 shows the most important source of information about innovations for three different samples of Ohio farmers (1) 61 muck vegetable growers interviewed in 1960, (2) the present sample of 76 truck growers in Washington County, and (3) a statewide random sample of 104 general farmers interviewed in 1957. The muck growers are the most specialized and the general farmers are least specialized.[10] Figure 6 indicated that more specialized farmers tend to depend on more direct sources of information with agricultural scientists.

Communication with Substation Farm by Adopter Category

Contact with the Substation Farm is generally more frequent for truck growers in the more innovative categories (Table 4). All of the innovators and over three-fourths of the early adopters in the sample had personally visited the Substation Farm in the past year. Innovators and early adopters were also much more likely to travel to the Substation Farm to secure personal help on a truck farming problem or to attend a Substation Farm field day.

Communication with Substation Farm by Community

The seven truck growing communities in Washington County varied considerably as to the extent of

[9] Chi square is 10.69 which is greater than the 7.82 required for significance at the five percent level. For the purposes of calculation, the data presented in Table 3 were collapsed into a 2x5 contingency table.

[10] Farm specialization is the degree to which a farmer concentrates his labor in one farm enterprise, such as beef, poultry, or vegetable crops.

TABLE 3.–Most Important Information Sources for New Farm Ideas by Adopter Category

Information Source	Adopter Category					All Growers	
	Innovators	Early Adopters	Early Majority	Late Majority	Laggards	Number	Percent
1. Visits to Substation Farm	50%	34%	16%	12%	8%	12	16%
2. Experiment Station Bulletins and Ohio Farm and Home Research	50%	33%	16%	7%	0%	10	13%
3. County Agent or Extension Bulletins	0%	11%	8%	18%	8%	9	12%
4. Radio or TV Farm Shows	0%	0%	0%	4%	0%	1	1%
5. Farm Magazines	0%	22%	32%	14%	25%	17	24%
6. Neighbors and Friends	0%	0%	20%	25%	25%	15	20%
7. Family or Relatives	0%	0%	8%	24%	33%	12	16%
Total	100%	100%	100%	100%	100%	–	101%*
Number	2	9	25	28	12	76	–

*The total is 101 percent due to rounding to nearest whole number.

their members' contact with the Substation Farm. Table 5 shows that farmers living in communities with more favorable norms on innovativeness, such as Oak Grove, were more likely to personally visit the Substation Farm. Truck growers from the Columbus, Cincinnati, and Toledo areas had no personal contact with the Substation Farm within the past year (Table 5).

Respondents were also asked whether they knew of the existence of the Substation Farm. Only two percent of the Washington County growers were not aware of the Substation Farm. Growers in the Columbus area were more likely to be aware of the Substation Farm than were truck growers in the Cincinnati or Toledo areas.

OPINION LEADERSHIP

Opinion leaders are individuals sought by others for information and advice. In the present study, 14 opinion leaders[11] were named by three or more other growers as a source of information and advice.

Characteristics of Opinion Leaders

Table 6 shows a comparison of the characteristics of the 14 opinion leaders with their 69 "followers". In general, opinion leaders are characterized by...

Slightly older age and slightly more education
Much larger truck crop enterprises
More cosmopoliteness

[11] Seven of these 14 opinion leaders were included in the sample of 76 growers and seven were not.

TABLE 4.–Communication with Substation Farm by Adopter Category

Communication Behavior	Adopter Categories					All Growers	
	Innovators (N = 2)	Early Adopters (N = 9)	Early Majority (N = 25)	Late Majority (N = 28)	Laggards (N = 12)	Number (N = 76)	Percent
1. Attended Substation Farm Field Day in Past Year	50%	33%	32%	7%	7%	16	21%
2. Visited Substation Farm to Secure Personal Help in Past Year	50%	44%	4%	11%	11%	18	23%
3. Visited Substation Farm Personally in Past Year	100%	77%	36%	18%	18%	26	34%

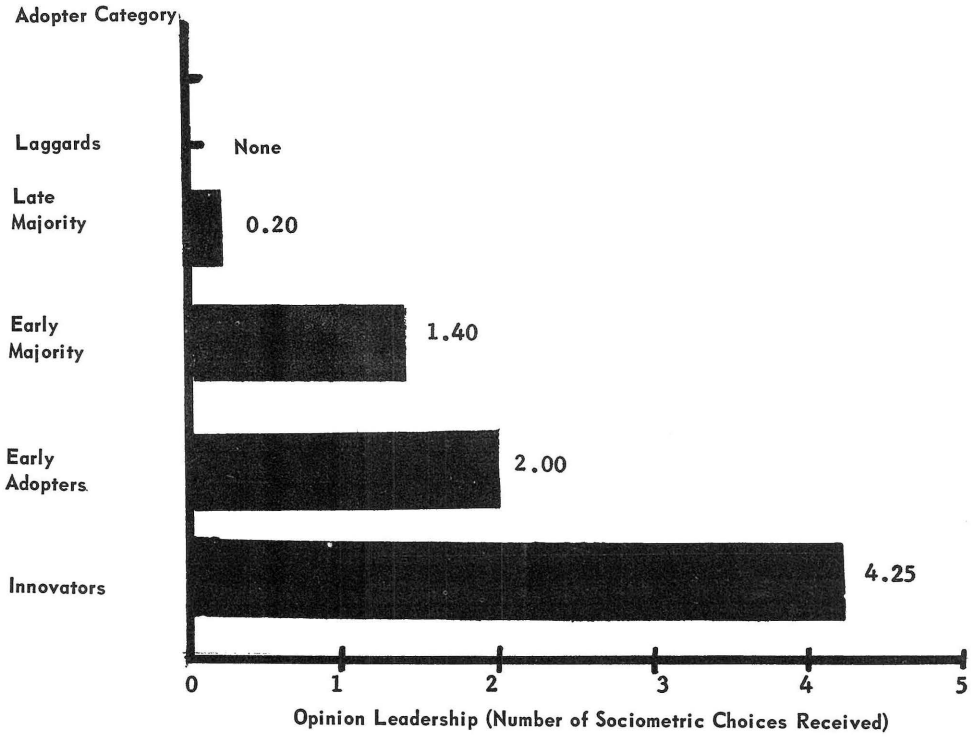


Figure 8.—Degree of Opinion Leadership by Adopter Category.

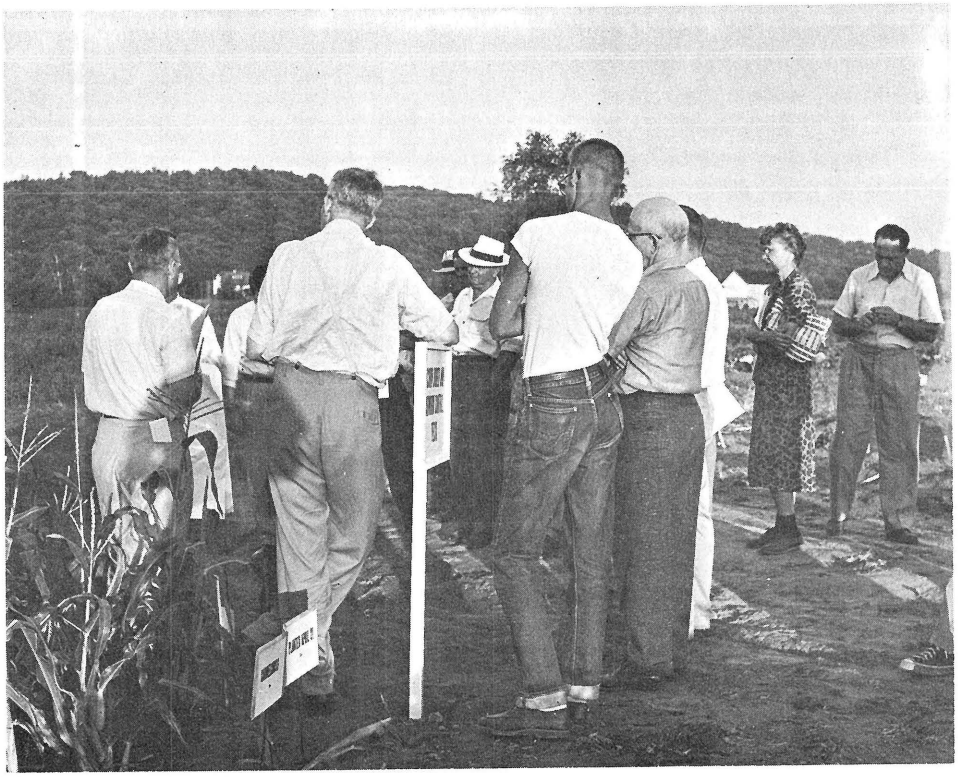


Figure 7.—Tours at the Substation Farm Include Discussions by Research Workers of Their Findings.

TABLE 5.–Personal Visits to Substation Farm Within the Past Year by Community

Community	Personal Visits to Substation Farm in Past Year		Total	
	Have	Have Not	Number	Percent
Columbus[a]	---	100%	11	100%
Cincinnati[a]	---	100%	9	100%
Toledo[a]	---	100%	9	100%
State Subtotal[a]	---	100%	29	100%
Oak Grove	56%	44%	8	100%
Devola	44%	56%	6	100%
Beverly	36%	64%	9	100%
Reno	12%	88%	7	100%
Lowell	24%	76%	16	100%
Belpre	29%	71%	7	100%
Hillgrowers	29%	71%	23	100%
Washington County Subtotal	35%	65%	76	100%
Total	27%	73%	105	100%

[a]For purposes of comparison with the Washington County growers, a 50 percent random sample of the 134 members of the Columbus, Cincinnati, and Toledo Vegetable Growers Associations were contacted by mailed questionnaire. Five growers responded that they were no longer in truck-growing; usable returns were received from 29 of the 62 remaining growers for a 46 percent response rate.

Information sources that are more direct to scientists

Higher social status

More innovativeness

Table 6 and Figure 8 show there is a direct relationship between innovativeness and opinion leadership for the entire sample of leaders and followers. In other studies, however, early adopters have sometimes been found to have more opinion leadership than innovators. One explanation may be that the innovators in the present study lived in the two communities with the most favorable norm on innovativeness. In communities where less innovative norms prevailed, other adopter categories were more likely to be opinion leaders.

Community Norms and Deviancy

It is possible to suggest a generalization supported by past research studies: community norms on innovativeness seem to determine, at least in part, the innovativeness of opinion leaders[12]. A test of this generalization is available from the present data.

A deviancy-from-norms score[13] was computed for each individual (both leaders and followers) as a ratio of the absolute difference between the respondent's adoption score and the community norm on innovativeness, to the range in all adoption scores in the community.

Table 6 shows that opinion leaders conform to the norms of their community much more closely than the followers. In the communities where the norms favored innovativeness, innovators and early adopters were the opinion leaders. In communities where the norms did not favor innovativeness, the opinion leaders were more likely to be early majority.

Seeker-Sought Relationships

In this section, the unit of analysis is the relationship of a "seeker" of information to the truck

[12]For example, the studies by Marsh and Coleman, *op. cit.*, and van den Ban, *op. cit.*, support this generalization.

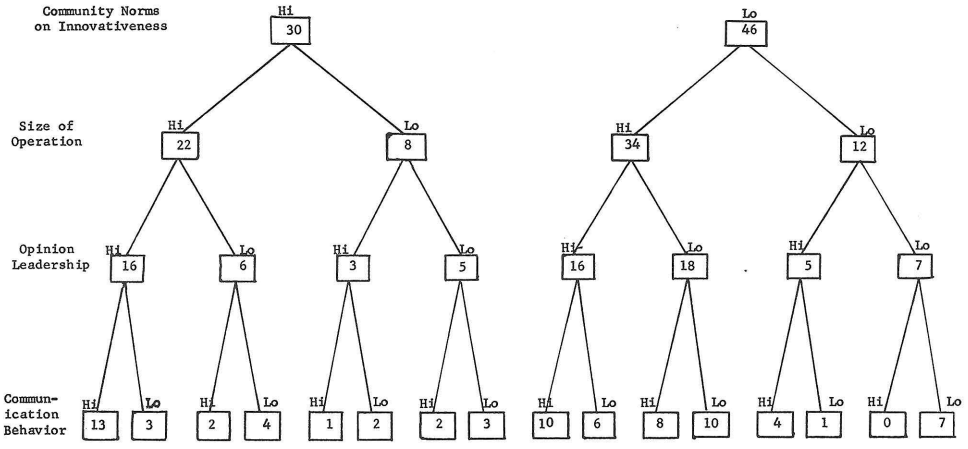
[13]The deviancy score $= \frac{|X_i - \bar{X}|}{\sigma}$

Where X_i = each respondent's adoption score

$\bar{X}$ = community norm on innovativeness for the community in which the respondent lives. The individual's adoption score was not included in computing the mean adoption score for each community in order to avoid possible redundancy.

σ = standard deviation of the adoption scores in the respondent's community.

Figure 9.—Large Amounts of Hand Labor Are Required in Truck Growing.



Innovators	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Early Adopters	7	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-
Early Majority	4	2	2	2	1	2	-	1	5	-	2	1	2	1	-	-
Late Majority	1	-	-	2	-	-	2	-	3	4	3	6	1	-	-	6
Laggards	-	-	-	-	-	-	-	2	-	2	3	3	1	-	-	1

Fig. 10. Prediction of Innovativeness with the Configurational Approach

TABLE 6.–Characteristics of Opinion Leaders and Followers

Characteristics	Opinion Leaders (N = 14)	Followers (N = 69)
1. Average Age of Respondents	55	51
2. Average Years of Education	10.9	10.4
3. Average Acres of Truck Crops	24	9
4. Average Number of Workers per Farm	8.9	6.6
5. Percent Who Travelled Outside of County During Past Year to Observe New Truck-Growing Ideas	36%	10%
6. Percent Naming Direct Contact with Substation Farm as Most Important Source of Information	64%	12%
7. Average Social Status	3.5	2.5
8. Average Adoption Score	5.38	4.10
9. Deviancy-from-Norms Score	.101	.617

grower from whom he seeks information, who is termed a "sought". Table 7 shows that there are no seeker-sought relationships between laggards and innovators. In fact, each adopter category is mainly influenced by individuals of the same or a more innovative adopter category. All but 10 of the 74 seeker-sought relationships are those in which the sought is of the same or a more innovative adopter category.

Predicting Opinion Leadership

Differences in social characteristics between opinion leaders and followers were shown in Table 6. In the present section, the joint effect of four of these independent variables in explaining opinion leadership is determined by means of multiple correlation techniques. The four independent variables and the percent of the variation in opinion leadership that each explain are:

Deviancy-from-Innovativeness-Norms	12.5%
Social Status	12.1%
Innovativeness	1.7%
Communication with Substation Farm	0.0%
Total	26.3%

Although only 26 percent of the variation in opinion leadership scores was explained by the four variables, the present analysis is suggestive of the approach that might be utilized to study opinion leadership in the future. It is important to note that the deviancy-from-norms scores explained a greater share of the variation in opinion leadership than any of the individual characteristics included in the analysis.

PREDICTING INNOVATIVENESS

Configurational Approach

One of two methods utilized in the present investigation to predict innovativeness is the configurational approach. This method consists of dividing a sample of respondents into relatively homogeneous

TABLE 7.–Information Seeker-Sought Relationships by Adopter Category

Growers Who Seek Others	Growers Who Are Sought by Others: Innovators	Early Adopters	Early Majority	Late Majority	Laggards	Total Choices Made
Innovators	3	4	1	0	0	8
Early Adopters	2	2	4	0	0	8
Early Majority	3	3	19	1	0	26
Late Majority	4	4	16	3	0	27
Laggards	0	1	4	0	0	5
Total Times Chosen	12	14	44	4	0	74*

*Several respondents did not name other truck growers as sources of information and advice about truck growing ideas, while some respondents named several "soughts".

subsamples on the basis of each of several independent variables. Each subsample is regarded as a separate unit for analysis since it has a unique configuration of independent variables. After successive breakdowns on the basis of the independent variables, which are usually dichotomized, the probability of a desired outcome is calculated.

The configurational approach to prediction is illustrated in Figure 10 and Table 8. Each of the four independent variables, community norms on innovativeness, size of operation in PMWU's, self-designated opinion leadership, and directness of communication behavior with scientists, were dichotomized as high or low. An example of the usefulness of the configurational approach can be illustrated if one follows the prediction lines to the three farmers in the Hi-Hi-Hi-Lo cell. One respondent with this configuration lives in a community with an innovative norm, has a large-sized farm and possesses high opinion leadership, has a low degree of communication behavior, but is an innovator. Perhaps he learns about new ideas from his innovative neighbors in his community. The configurational approach allows the investigator to follow a particular respondent through the various independent variables and to determine exactly which factors account most for his position on the innovativeness dimension.

Multiple Correlation

Another method used in the present investigation to predict innovativeness is that of multiple correlation. Multiple correlation is a mathematical method whereby a series of independent variables are related to one dependent variable. Several rural sociologists have used multiple correlation to predict innovativeness in past studies with varying amounts of success. From 17 to 56 percent of the variation in innovativeness has been predicted in these analyses.[14]

In the present study, five independent variables were included in a multiple correlation analysis in order to predict innovativeness (Table 9). The independent variables are community norms on innovativeness, size of operation in PMWU's, self-designated opinion leadership, directness of communication behavior with scientists, and social status. About 64.1 percent of the variation in innovativeness was explained by five independent variables, which is the largest amount of variation in innovativeness yet explained.

The amount of variation in innovativeness explained by each of the five independent variables is:

Community Norms on Innovativeness	20.0%
Size of Operation	14.4%
Opinion Leadership	14.4%
Communication Behavior	8.9%
Social Status	6.4%
Total	64.1%

When compared to previous studies, the relatively larger amount of variation in innovativeness explained by the multiple correlation approach to prediction is mainly due to the inclusion of a previously unused variable, community norms on innovativeness. This finding suggests the importance of relating innova-

[14] Typical of the eight multiple correlation prediction studies by rural sociologists are James H. Copp, Personal and Social Factors Associated with the Adoption of Recommended Farm Practices Among Cattlemen, Manhattan, Kansas Agricultural Experiment Station Technical Bulletin 80, 1956; and Frederick C. Fliegel, "A Multiple Correlation Analysis of Factors Associated with Adoption of Farm Practices," Rural Sociology, 21:284-292, 1956.

TABLE 8.--Relative Effectiveness of the Configurational Approach in Predicting Innovativeness

Configuration	Innovators	Early Adopters	Early Majority	Late Majority	Laggards	Total
Four Hi's	1	7	4	1	–	13
Three Hi's, One Lo	1	2	10	3	2	18
Two Hi's, Two Lo's	–	–	8	12	6	26
One Hi, Three Lo's	–	–	3	6	3	12
Four Lo's	–	–	–	6	1	7
Total	2	9	25	28	12	76

TABLE 9.–Intercorrelations of Variables Utilized in the Multiple Correlation Approach to Predict Innovativeness

	Community Norms on Innovativeness	Size of Operation	Opinion Leadership	Communication Behavior	Social Status
1. Innovativeness	+.564**	+.595**	+.596**	+.583**	+.510**
2. Community Norms on Innovativeness	———	+.298**	+.264*	+.286*	+.370**
3. Size of Operation		———	+.460**	+.524**	+.428**
4. Opinion Leadership			———	+.635**	+.392**
5. Communication Behavior				———	+.378**
6. Social Status					———

*Significant at the five percent level.

**Significant at the one percent level.

tiveness to group norms as well as to social characteristics in future research.[15]

CONCLUSIONS

Future research efforts need to select independent variables for the prediction of innovativeness with more attention to theoretical considerations. Most past research in this area has simply studied the characteristics of individuals associated with innovativeness. A next step is to develop a model to explain theoretically how adoption of an innovation takes place in a social system. Then the ability of this model to predict innovativeness may be assessed with a configurational or a multiple correlation approach.

Obviously, an assumption of the proposed research is that predicting innovativeness is a worthwhile effort for sociologists. The prediction of adoption has utility for research organizations and for commercial companies who wish to know which individuals in their audience will be the first to adopt an innovation they are about to release. There is also great practical usefulness in predicting innovativeness for change agents who wish to understand more clearly the independent factors related to innovativeness, and the interrelationships among these independent variables.

The present study clearly shows the importance of community norms on the innovativeness of individuals living in the community. Community norms on innovativeness were the most effective single factor in explaining the variation among the innovativeness of truck growers. This finding offers support for the basic sociological principle that group norms affect the behavior of members of a group. Because behavior is influenced by group norms, it may be wiser for a change agent to attempt to affect the group as a whole rather than to make one person deviate from the group's norms. Perhaps change agents need to utilize a long range approach to change through altering basic attitudes and values rather than promoting single innovations in order of their appearance on the agricultural scene. Even when change agents provide individual advice on farm matters, they should remember that this information is likely to be interpreted by the individual in terms of the group's norms.

Group norms may be difficult to change but if it is possible, a change agent should probably concentrate his efforts among the opinion leaders in the group. The present findings show that the opinion leaders closely reflect the group norms on innovativeness. It is not yet known whether a change in the opinion leader's innovativeness would be reflected in a change in the community norms or whether the opinion leader would lose his influence with other group members.

In some areas of the U.S., rural community boundaries are still distinct and wide differences in community norms exist. However, the community is decreasing as a meaningful reference group to most U.S. farmers.[16] In developing societies, however,

[15] This point has been suggested by Murray A. Straus, "Family Role Differentiation and Technological Change in Farming," Rural Sociology, 25:219-228, 1960. One caution should be injected in the interpretation of the present findings. The relationship between individual innovativeness and community norms on innovativeness may in one sense be circular. Correlation between these two variables (+.564 in the present study) is influenced by the range of individual innovativeness scores around the norm (or mean score). For example, if 10 farmers in one community all have innovative scores of 6.5, there is a perfect relationship between each score and the norm.

[16] The community is probably a more important reference group to truck growers than to most other types of farmers because truck growers tend to cluster in certain localities. For example, the respondents in the present study were clustered in seven communities in Washington County.

neighborhoods and communities are one of the most important group influences on farmer decisions. For example, wide differences in innovativeness norms exist between India villages that are but a few miles apart. Even in much of the U.S., however, the norms of groups other than the community are important to farmers in their decisions to adopt or reject new ideas. The norms of friendship cliques, special interest organizations, families and other groups are important influences in affecting a farmer's decisions.

Further study is needed of the effect of various norms on a farmer's adoption decisions, especially when the individual is influenced by conflicting group norms.

OTHER OHIO PUBLICATIONS ON THE DIFFUSION OF INNOVATIONS

The following publications are listed for the reader who is interested in further detail on certain areas of the diffusion of farm innovations. Copies may be obtained from the Ohio Agricultural Experiment Station, Wooster, Ohio.

1. Everett M. Rogers and Harold R. Capener, The County Extension Agent and His Constituents, Wooster, Ohio Agricultural Experiment Station Research Bulletin 858, 1960.

2. Everett M. Rogers and Ron L. Pitzer, The Adoption of Irrigation in Ohio, Wooster, Ohio Agricultural Experiment Station Research Bulletin 851, 1960.

3. Everett M. Rogers and M. Dwayne Yost, Communication Behavior of County Extension Agents, Wooster, Ohio Agricultural Experiment Station Research Bulletin 850, 1960.

4. Everett M. Rogers and Rabel J. Burdge, Muck Vegetable Growers: Diffusion of Innovations Among Specialized Farmers, Wooster, Ohio Agricultural Experiment Station Research Circular 94, 1961.

5. Everett M. Rogers, Characteristics of Innovators and Other Adopter Categories, Wooster, Ohio Agricultural Experiment Station Research Bulletin 882, 1961.

6. Everett M. Rogers and A. Eugene Havens, Extension Contact of Ohio Farm Homemakers, Wooster, Ohio Agricultural Experiment Station Research Bulletin 890, 1961.

7. Everett M. Rogers and Frank O. Leuthold, Demonstrators and the Diffusion of Fertilizer Practices, Wooster, Ohio Agricultural Experiment Station Research Bulletin, in press.

8. Everett M. Rogers and A. Eugene Havens, The Impact of Demonstrations on Farmers' Attitudes Toward Fertilizer, Wooster, Ohio Agricultural Experiment Station Research Bulletin 891, 1961.

ACKNOWLEDGMENTS

The authors wish to thank the following persons for their help in the present study: Harold Racer, Manager of the Vegetable Crops Substation Farm at Devola, Ohio; Herbert Vander Poel, retired County Extension Agent, Agriculture, and Don Gehres, present County Extension Agent, Agriculture, in Washington County; Robert Keller, Manager of the Marietta Truck Growers Association; A. Eugene Havens, Assistant Professor in Rural Sociology, David G. Cartano and William L. Flinn, Research Assistants in Rural Sociology, and George A. Ridenour for help in data tabulation; and finally, to the truck growers of Washington County for their cooperation in the present investigation.

This page intentionally blank.

This page intentionally blank.